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PRODUCTION METHOD OF SEASONED PROTEIN INGREDIENT

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Specification

1. [Title of the invention]

Production method of seasoned protein ingredient

2. [Scope of the patent claims]

1. it is the production method of seasoned protein ingredient in which protein raw material and fermented bean cured foods are cooked by extrusion in hydrous condition.

3. [Detailed explanation of the invention]

[Utilized field in industry]

The present invention relates to the production method of seasoned protein ingredient in which it does not become tasteless very much by chewing, and it is very tasty when it is cold.

[Prior arts]

Traditionally, many inventions have been attempted regarding meaty protein ingredients. One of its major production methods is an extrusion cooking method. It is rare that meaty protein ingredient itself is seasoned. The reason is that it is secondarily seasoned depending on the usage.

In the recent years, since people started to eat the foods which has meaty protein ingredient itself as the main food (for instance, fried chicken, steaks and the like), meaty protein ingredient which is tasty by itself has been in demand.

And, regarding the seasoning method of meaty protein ingredient, other than providing the secondary seasoning (seasoning the

protein ingredient, a method to provide a primary seasoning is known (protein ingredient is prepared by combining the seasoning agent with the raw material of protein ingredient), the problem of seasoned protein ingredient is that as it is chewed, it becomes tasteless very quickly.

By the way, fermented bean cured food is one of fermented foods of soy beans, and are eaten in China and Taiwan and the like. For instance, in China, using the soy beans as the main material, normally it is dehydrated and the like and the water content is adjusted, then, it is mildewed, and soaked in seasoned liquid and the like, then, aged, thus producing fermented bean cured food. Or in Taiwan, using soy beans as the main material, normally, it is dehydrated thus adjusting the water, then, shape retention of tofu is increased, and is soaked in koji yeast liquid (rice koji yeast liquid, bean koji yeast liquid and the like), and aged, thus fermented bean cured food is produced. And in Okinawa prefecture, [Tofu?] is also a traditional fermented bean cured food like, and tofu is dried and smoked by sun shine, thus water content is reduced (normally about 50%), thus shape is retained, and is soaked in koji yeast (rice ? and Okinawa Shochu (Japanese sweet potato spirit and others), and aged. And at Gokeso in Kumamoto Prefecture, [Miso ? tofu] is known. Regarding this, tofu is grilled over fire and the like to reduce water content in order for it to retain the shape, and it is soaked in the miso produced by growing yeast in

soy beans, wheat, sticky rice, and aged.

However, production method of protein ingredient using these fermented beam cured foods is not known yet.

[Problems the present invention attempts to solve]

As described in the previous items, even if the protein ingredient is seasoned (primary seasoning or secondary season), the problem is that it becomes tasteless as chewed. And when the chickens are fried, it is tasty when it is hot; the problem is that when it cools, the tastiness (flavor which provides tastiness) decreases quite a bit.

[Means to solve the problems]

The inventors herein, while doing research in order to solve the aforementioned problems, studied the number of seasonings and seasoning raw material, if fermented beam cured foods are used, found out that the aforementioned problem can be solved, thus completing this invention.

That is, the present invention is the production method of seasoned protein ingredient in which protein ingredient and fermented beam cured foods are cooked by extrusion in the hydrous state.

The protein ingredient used for the present invention uses one type or two type or more from the proteins obtained from oil seeds such as soy beans, rape related vegetables, peanuts and the like, the protein obtained from grains such as gluten and the like, in

addition, vegetable protein, animal protein and the like obtained from casein, egg white, bird, animals, fish and shell fish and the like.

Fermented beam cured foods used for the present invention are fermented food which uses tofu as the raw material, and mildew such as yeasts and the like in the process of fermentation and aging contributes. For instance, it is preferred if it is (1) mildew is grown in tofu and it is soaked in seasoning liquid and aged, (2) if tofu is soaked in the yeast and aged. The former is known as the production method in China and the like, and the latter is known as the production method of Taiwan, Okinawa Prefecture and Gokaso in Kumamoto prefecture and the like. Fermented bean cured foods can be dried or powdered and used.

Tofu used for fermented beam cured foods are the tofu produced by normal method from soy beans and degreased soy beans (locally sold tofu and the like), in addition, has the soy bean protein and oils and fats as main material, and depending on the needs, can be soy bean protein curd and the like prepared by using alkali earth metal salt. When mildew is grown in tofu, and soaked in seasoning liquid, or, when it is soaked in yeast without growing mildew, in order for tofu to retain the shape and not to be contaminated by various germs, and also, to make it easy for mildew to grow, it is preferred that by dehydration or drying and the like, water content is adjusted. Normally, water content of 50~80%

is preferred.

Regarding the mildew to grow in tofu, normally, it is Monascus type, Mucor type, Rhizopus type, Actinomucor type and the like.

The tofu wrapped by hypha of the mildew (it is preferred to use one before forming spores) is soaked in salt if necessary, then, soaked in seasoned liquid.

Regarding the seasoning liquid, one with table salt and spices as main material can be used. It is speculated that the alcohol protein such as rice wine and the like and table salt prevents rotting during aging, and mildew that grows on tofu and other microorganism and seasoning liquid gives the tastiness and texture to the tofu. And, Monascua aeka can be used for coloring.

And, the yeast liquid in which fermented bean cured food is soaked can use the yeast of the grains such as rice yeast, soy beans yeast.

That is, rice, wheat, soy beans and the like are steamed, Aspergillus type mildew is planted, fermented, and using well known methods, it can be prepared. In case of rice yeast, it is rich in sugar content, and alcohol portion, and sweet and tasty many times, and in case of soy bean yeast, it is rich in amino acids and tasty many times. Soy bean is aged in this yeast liquid.

Regarding the aging time after soaking in seasoning liquid or yeast liquid, it can be adjusted depending on the preference, one year or less is sufficient, and normally, 1 month to half a year

is suitable.

Fermented beam cured foods obtained after aging is the fermented food which has 50~80% of water and soft and cheesy and smooth (fermented beam cured foods is called Chinese cheese) and has a unique smell and strong tastiness. Normally, traditional fermented beam cured foods has free amino acid content amount 10~20%, non protein nitrogen is 30~80% (many times 50~70%) in the entire nitrogen. At the time of aging, rather than one soaked in yeast liquid, one with the seasoning liquid with sake as the main material tends to have a lower direct reduction sugar content, and at the time of extrusion cooking, there is very little coloring by Maylard reaction under pressurization and heating, hence, depending on the targeted protein ingredient, it can be used for different purposes.

The usage amount of fermented beam cured foods differs depending on the targeted protein ingredient, the ratio of protein raw material and other materials, and degree of bloating and the like, hence, its amount is not limited, however, when it targets the protein ingredient which is organized and bloated by extrusion cooking, normally, relative to the raw material 100 weight part without water, fermented beam cured foods (assuming that water content is 50~80%) 1 weight part or more, preferably 5~30 weight part is suitable. It depends on the aging degree of fermented beam cured foods, fermented beam cured foods is 1 weight part or more,

and when chewed, it does not become tasteless, and when cooled, it is tasty, thus obtaining the most suitable one for protein ingredient. In case the protein ingredient of bloating type is targeted, if the fermented beam cured foods exceeds 30 weight parts, it tends to prevent bloating. Or regarding the smaller bloating or non bloating type (for instance, sheet shaped), it depends on the heating temperature of extrusion cooking also, using about 50 weight parts, it can be organized.

As other raw materials, grains, grain powder, and other starch material, and polysaccharides derived from grains such as flax stalks and grains type, polysaccharides derived from sea weeds and microorganism, and gum type and the like can be combined. Starches assist bloating and have the effect of smoothing the texture. Polysaccharides and gums have the effect of improving the texture. Furthermore, in addition, using oils and fats and oil and fat containing emulsion (w/O type, O/W type is not questioned) can be used freely. Particularly, in case extrusion cooking is by two shafted extruder, even if oil portion is contained in raw material, easily bloating protein ingredient can be obtained, thus improving the eating sense by oil and fat.

Regarding the hydrous state in the present invention, it means that raw material that contains water content is cooked by extruder, and in addition to the water, water can be derived from extraction such as fermented beam cured foods, soy bean, extract

from plants and the like. And, as to the water adding method, it can be before extrusion cooking or at the stage on the way.

It depends on the targeted protein ingredient, water content normally can be 10~80 we% in the raw material. In the present invention, regarding extrusion cooking, it can use well known extruder, can be pushed out under pressurization and heating. It does not matter whether it is one shaft extruder or two shaft extruder. If the targeted protein ingredient has more meaty texture or intends to stir up the eating feeling, two shafted extruder or plural shafted extruder can obtain the protein ingredient superior in fiber structure and is preferred. And, in case of organizing the material in which the oil portion is contained in the raw material, two shafted extruder or plural number shafted extruder is more preferred.

Regarding the extent of pressurization, it can be set at about 0.5~100 kg/cm² near the exit port of the extruder.

Regarding the extent of heating, it can be set at about 80 ~ 250 deg C near the exit of the extruder. It is optional as to whether the vicinity of exit is cooled or not.

As to the die of extruding port and orifice, well known one can be used. As to the push out direction, it can be same as the push out direction of screw and the centrifugal direction of screw just like peripheral die. The shapes of exit die or orifice can be selected to fit the purpose. Single hole, multiple holes, mesh

shape, long die and the like that are well known can be used.

[Embodied example]

The embodied example of the present invention will be explained using the following embodied example.

Embodied example 1

Protein ingredient was produced by the raw material combination shown in table 1

Table 1 raw material combination (unit is weight part)

No.	1	2	3	4	5	6
Separated soy bean protein	65	65	65	65	65	65
Flax stalks	20	20	20	20	20	20
Wheat gluten	10	10	10	10	10	10
Starch	5	5	5	5	5	5
Soy sauce	5	-	-	-	-	-
fermented beam cured foods	-	3	6	10	20	30
Table salt	1	1	1	1	1	1
Seasoning	1.5	1.5	1.5	1.5	1.5	1.5

And, Chinese product was used for fermented beam cured foods (water content 70%). And for seasoning, protein hydrolyzed seasoning (HVP=hydrolyzed vegetable protein) was used.

While adjusting so that relative to the 100 weight part of the raw material for wheat -1 (excluding water content of fermented beam cured foods) it attains the added water amount of about 30 weight part (contains the water content of fermented beam cured foods), it was fed to two shaft extruder ($L/D=14.4$), the barrel front end temperature is 150 deg C, and with screw rotation number 250 rpm, it is pushed out from round type die (5mmΦ), and

continuously cut up by a cutter, thus obtaining granular textured protein ingredient of 10~20 mmΦ.

Each dried protein ingredient is returned to 6 fold of warm water, and it is lightly drained, and made into about 3 fold hydration condition then, flavor and tastelessness when chewed was studied.

The result is shown in table 2

(The following is blank)

Table 2

No	Tastiness	Smell	Appetite	Tastelessness
1	o	o	o	x
2	Δ	o	o	Δ
3	o	o	o	o
4	o	o	o	o
5	o	Δ	o	o
6	o	Δ	Δ	o

Tastiness: Δ: somewhat weak tastiness

o: tastiness is strong and delicious

Smell: Δ: special smell is there and it is bothersome

o: there is a faint special smell but it stirs appetite

Eating feeling: Δ: texture gets unstable sometime, sometimes eating feeling decreases

o: has a meat like eating feeling

Tastelessness: X: while chewing, it becomes tasteless quickly

Δ: while chewing, there is a very little tastelessness, but the taste is somewhat weak

O: while chewing, it does not become tasteless easily and tastiness holds

Embodied example 2

Protein ingredient is obtained doing same as in embodied example 1, and is returned to the warm water, then, locally purchased flax stalk powder is battered in the batter liquid dissolved in a cold water(1: 1.2 W/W), and is fried in Tempura oil of 170~180 deg C for 1 minute 20 seconds, thus obtaining fried chicken.

First, the water content of fried chicken obtained is prevented from evaporating (lapped) and left alone for 24 hours. This is the group A.

Next, doing same as before, friend chicken is prepared. This is the group B.

Using 16 panelists, the group A and group B ate them and compared the flavor (taste). The result is shown in table 3.
(The following is blank).

Table 3 the number of people who compared group A and group B

No.	No change in flavor	Flavor improved	Flavor deteriorated
1	4	1	1
2	6	1	9
3	8	2	6
4	8	4	4
5	5	6	5
6	4	7	5

As shown above, compared with No. 1, No.2 ~ No.6, shows a few flavor

deterioration of the A group, compared with group B,

Embodied example 6

Doing same as No. 5 of embodied example 1, fermented bean cured food was changed to fermented beam cured foods produced in Taiwan, [Tofu?] by Okinawa Pref and [Miso ? tofu by Gokaso, protein ingredient was produced.

Compared with No.5 of embodied example 1, protein ingredient which used fermented beam cured foods produced in Taiwan tends to be a little brownish, but they are were superior in flavor and eating feeling, and while chewing, there was very little tastelessness.

And, fried chicken was produced doing same as in embodied example 2, the eating feeling and flavor were inspected after cooling; it was delicious in a cold condition.

[Effects of the invention]

As explained above, due to this invention, the seasoned protein ingredient thus obtained is very low in tastelessness while being chewed and, delicious when it is cooled.